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D E C I S I O N
of 5 June 2002

Case Number: T 0879/99 - 3.2.4

Application Number: 91112774.4

Publication Number: 0472933

IPC: F04C 29/00

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Title of invention:
Fluid rotating apparatus

Patentee:
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

Opponent:
Halberg Maschinenbau GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 111(1), 113(1), 114

Keyword:
"Remittal to first instance for further prosecution (second auxiliary request"
"Late filed documents - no substantial procedural violation"

Decisions cited:
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Catchword:
-

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Case Number: T 0879/99 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 5 June 2002

Appellant: (Opponent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 27 July 1999 concerning maintenance of European patent No. 0 472 933 in amended form.**

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
H. Preglau

Summary of Facts and Submissions

I. The opposition division's interlocutory decision that the amended European patent No. 0 472 933 met the requirements of the EPC was posted on 27 July 1999.

The appellant (opponent) filed an appeal and paid the appeal fee on 9 September 1999, and filed a statement of grounds on 18 November 1999.

II. Both parties attended oral proceedings on 5 June 2002 during which the respondent (proprietor) presented a new main request and two new auxiliary requests.

III. The independent claim 1 of the main request is the same as that of the first auxiliary request and reads:

"A fluid rotating apparatus comprising:

- a housing (201);
- a plurality of motor-driven rotors (204, 205) accommodated in said housing (201) wherein each of said rotors (204, 205) has a spiral groove (242, 252) formed in a peripheral surface thereof and wherein said plurality of rotors (204, 205) do not come into contact with each other due to contact preventing gears (244, 254) which are provided at the end of the peripheral surface of the rotors (204, 205) wherein a space (backlash δ_2) in the engagement portion between both contact preventing gears (244, 254) is smaller than a space (backlash δ_1) in the engagement portion between the spiral grooves (242, 252) formed on said rotors (204, 205);
- bearings (216, 217) rotatably supporting said rotors (204, 205);
- a fluid suction port (214), and a fluid discharge port (215) formed in said housing (201);

- a plurality of motors (206, 207) respectively operably connected to said rotors (204, 205) for independently driving said rotors (204, 205); and
- means (291-296) for detecting rotational angles and numbers of rotations of said motors (206, 207), and controlling said motors (206, 207) to drive said rotors (204, 205) synchronously on the basis of the rotary angles and the numbers of rotations detected so that the rotors (204, 205) and the contact preventing gears (244, 254) will not come into contact with each other during the normal operation of the fluid rotating apparatus."

IV. The independent claim 1 of the second auxiliary request is the same as that of the main request except that the section of the claim which starts in line 3 reads:

"- a plurality of motor-driven rotors (204, 205) accommodated in said housing (201) wherein each of said rotors (204, 205) has a spiral groove (242, 252) formed in a peripheral surface thereof and wherein said plurality of rotors (204, 205) do not come into contact with each other due to contact preventing gears (244, 254) which are provided at the end of the peripheral surface of the rotors (204, 205) so that they are an integral part of the peripheral surfaces of the rotors (204, 205) wherein a space (backlash δ_2) in the engagement portion between both contact preventing gears (244, 254) is smaller than a space (backlash δ_1) in the engagement portion between the spiral grooves (242, 252) formed on said rotors (204, 205);"

V. The following documents played a role in the appeal proceedings:

D1(A) Patent Abstracts of Japan, publication number 01063689, in English, being an abstract of application number JP-62-218939

D1(B) JP-A-64-63689, published 9 March 1989 (JP-62-218939)

D1(T) Translation of D1(B) into German

D2 GB-A-809 445

D3 DE-C-387 535

D4 EP-B-0 161 130

D8 US-A-4 747 762

D9 US-A-258 535

D10 US-A-1 583 232

Since no translations were provided, the board did not consider the following Japanese documents:

D6 JP-A-54-62 515

D7 JP-A-52-37 214

VI. The appellant argued in the appeal proceedings that the opposition division's wrong decision to exclude D3 and D4 as late filed justified reimbursement of the appeal fee and that the claimed subject-matter was obvious from various combinations of prior art documents.

The respondent countered the appellant's arguments.

VII. The appellant requests that the decision under appeal be set aside, that the patent be revoked and the appeal fee be reimbursed.

The respondent requests that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 3 as filed during the oral proceedings (main request) or on the basis of claims 1 to 3 as filed during the oral proceedings (first auxiliary request) or on the the basis of claims 1 to 3 as filed during the oral proceedings (second auxiliary request) and description pages 2, 2a, 2b, 3 and 4 and Figures 1A, 1B and 2 to 6 as filed with the letter of 15 May 2002 (first and second auxiliary request).

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments - claim 1 of the main and first auxiliary requests*

2.1 The board supports - and the appellant has not disputed - the finding in section 2 on page 3 of the decision under appeal that the amendments made to the original claim 1 to arrive at the claim 1 upon which said decision was based did not contravene Articles 123(2) and (3) EPC.

2.2 The amendments made to claim 1 according to the interlocutory decision in order to arrive at claim 1 of the present main request are:

- "wherein each of said rotors (204, 205) has a spiral groove (242, 252) formed in a peripheral surface thereof"

based on the originally filed claim 2 (granted claim 4);

- "wherein a space (backlash δ_2) in the engagement portion between both contact preventing gears (244, 254) is smaller than a space (backlash δ_1) in the engagement portion between the spiral grooves (242, 252) formed on said rotors (204, 205)"

  based on page 9, lines 9 to 14 of the originally filed description (column 3, lines 54 to 58 of the granted description); and

- "so that the rotors (204, 205) and the contact preventing gears (244, 254) will not come into contact with each other during the normal operation of the fluid rotating apparatus"

  based on the page 9, lines 14 to 22 of the originally filed description (column 4, lines 1 to 9 of the granted description).

2.3 The board thus finds that these amendments do not contravene Article 123(2) EPC and, since they restrict the claim compared with that as granted, they do not contravene Article 123(3) EPC either.

The board has no objections under Article 123 EPC to the dependent claims of the main and auxiliary requests or to the accompanying description and drawings.

2.4 In the oral proceedings the appellant had no objections under Article 123 EPC to the main and auxiliary requests.

3. *Novelty - claim 1 of the main and first auxiliary requests*

3.1 As agreed by the board and both parties, the closest prior art is the apparatus shown in Figures 6 and 7 of D1(B) with contact preventing gears 23A and 23B, see page 8, line 32 to page 9, line 18 of the translation D1(T).

Figures 6 and 7 show the contact preventing gears 23A and 23B spaced from the ends of the rotors 11A, 11B, 12A and 12B.

3.2 On the other hand, claim 1 of the main and first auxiliary requests specifies "contact preventing gears (244, 254) which are provided at the end of the peripheral surface of the rotors (204, 205)".

Thus, as agreed by both parties, the subject matter of this claim is novel (Articles 52(1) and 54 EPC).

4. *Inventive step - claim 1 of the main and first auxiliary requests*

4.1 The problem facing the skilled person is to try to make the apparatus shown in Figures 6 and 7 of D1(B) more compact without decreasing its performance.

4.2 Figures 6 and 7 of D1(B) show that the contact preventing gears 23A and 23B are spaced from the ends of the rotors 11A, 11B, 12A and 12B and are located between transverse walls of the housing.

4.3 D3 discloses a Roots blower with gears c and d directly on the ends of the rotors a and b. The gears are driving gears so that a drive applied to one gear wheel c causes the other gear wheel d to rotate so that both rotors a and b rotate synchronously.

4.4 Although it seems likely that the gears c and d of D3 are contact preventing gears to prevent the rotor surfaces from contacting each other (as is the case in the apparatus of D1(B)), this is not explicitly stated in D3.

However the gears c and d of D3 clearly differ from the gears 23A and 23B shown in Figure 6 of D1(B) at least in that the gear wheels c and d of D3 are normally **in contact** with each other (because one c transfers power from to the other d) whereas the gears 23A and 23B shown in Figure 6 of D1(B) are normally **not in contact** with each other (since the motors 15A and 15B are controlled to drive the gears 23A and 23B separately and synchronously). Moreover in D3 only gear wheel c is driven directly and this gear wheel c drives the other gear wheel d whereas in D1(B) both gears 23A and 23B are driven directly and separately.

4.5 The comments in section 4.4 above also apply in general terms to the apparatuses shown in D8 (Figure 8: rotors 8 and 10, gears 28 and 30), D9 (Figures 3 and 4: rotary pistons D, gears S), and D10 (Figures 1 and 2: rotors 11 and 12, gears 14).

4.6 Thus the gears 23A and 23B of D1(B) function differently to the gears of D3 and D8 to D10. Nevertheless the apparatus of D1(B) with its controlled dual motor driving of the rotors is a development of such earlier single motor apparatuses where power is transferred from one gear to another. Thus the skilled person would be expected to bear these earlier constructions in mind when further developing the apparatus of D1(B).

4.7 Figures 1 and 2 of D1(B) show a first fluid rotating apparatus with rotors 11A and 12A (and 11B and 12B) separated by and linked by a shaft 10A (and 10B).

Figures 4 and 5 of D1(B) show a second fluid rotating apparatus which differs from that shown in Figures 1 and 2 essentially in that the rotors 11A and 12A (and 11B and 12B) are next to each other i.e. not separated by a shaft. Although page 8, lines 26 to 31 of D1(T) comments only that the rigidity and control properties are thereby improved, it cannot have escaped the eye of the skilled person that additionally the apparatus has been reduced in size.

Figures 6 and 7 of D1(B) show the third fluid rotating apparatus which is similar to that of Figures 1 and 2 in that the rotors are separated by and linked by shafts, the difference being the presence of the gears 23A and 23B.

The board considers that it would be obvious for the skilled person to modify the third fluid rotating apparatus of Figures 6 and 7 to bring the rotors 11A and 12A (and 11B and 12B) towards each other, omitting the short shafts so that the rotors abut the gears 23A and 23B. The result would be a more compact version of Figures 6 and 7 in the same way that Figures 4 and 5 shows a more compact version of Figures 1 and 2. The resultant construction, apart from the two motor aspect, is known to him from D10 whose Figures 1 and 2 show rotors 11 and 12 abutting intermediate gears 14.

4.8 The respondent argues that D1(B) teaches the necessity for intermediate walls and a separate chamber for the gears 23A and 23B in Figures 6 and 7 and that therefore it would not be obvious for the skilled person to proceed otherwise. The respondent surmises that the designer, firstly, separated the rotors and gears so

that manufacturing was easy and, secondly, located the gears 23A and 23B in the separate chamber to avoid the gears negatively influencing the fluid flow e.g. by creating turbulence such as might occur in high speed vacuum pumps.

4.9 It must first be pointed out that the final argument about possible turbulence in high speed vacuum pumps, even if correct, could not be wholly applicable in the present case because claim 1 of the main and first auxiliary requests refers to a fluid rotating apparatus without restriction to high speed vacuum pumps. Moreover D1(B) concerns both compressors and vacuum pumps (see D1(T), page 6, lines 20 and 26).

4.10 Lubrication of the contact preventing gears apparently plays no role when deciding whether to locate them in the fluid chamber or in a separate chamber. The gears 23A and 23B of Figures 6 and 7 of D1(B) are located in a separate chamber even though they are not lubricated (see D1(T) page 8, line 37 to page 9, line 1), whereas the present contact preventing gears 244 and 254 are lubricated (see column 3, lines 51 to 53 of the patent as granted) but are located in the same chamber as the rotors.

4.11 The respondent provides no evidence to back up his theory that avoidance of turbulence led the skilled person to put the gears 23A and 23B of Figures 6 and 7 of D1(B) in a separate chamber and the board can see no reason for assuming that the respondent might be correct.

It can be seen that the gears 14 of D10 are attached to the rotors 11 and 12 and are not housed separately therefrom. The same applies to D8 (see column 3,

lines 15 to 17: "the gears 28 and 30 are within the casing and are bolted or screwed to the respective rotors 8 and 10") and to D9 (see page 1, lines 43 and 44: "gears SS within the casing").

Thus D8 to D10 show that there is no prejudice against locating the gears in the same chamber as the rotors.

Moreover since D1(T) does not mention the intermediate walls and a separate chamber it seems to the board that the designer did not consider them as important.

4.12 If nevertheless it were true that locating the gears in the same chamber as the rotors would negatively influence the flow then it must be pointed out that the inventor of the present apparatus has also located the gears in the same chamber as the rotors without however specifying any means in the independent claim (or indeed in the patent as a whole) for overcoming the difficulty.

4.13 Thus the board concludes that it would be obvious for the skilled person to modify the third fluid rotating apparatus of Figures 6 and 7 of D1(B) to arrive at an apparatus satisfying claim 1 of the main and first auxiliary requests (Articles 52(1) and 56 EPC).

5. Thus the respondent's main and first auxiliary requests must be refused.

6. *Amendments - claim 1 of the second auxiliary request*

6.1 This claim 1 includes the amendments dealt with in section 2 above.

6.2 The additional amendment in this claim 1 states that the contact preventing gears 244, 254 "are an integral part of the peripheral surfaces of the rotors (204, 205)".

6.3 This additional amendment is derived from Figure 1A of the originally filed patent application (Figure 1A as granted) which shows a sectional view of the present apparatus including cylindrical rotor 205 with a groove 252 and a gear 254, the rotor 205 having the same cross hatching throughout.

6.4 The board does not follow the appellant's view that Figure 1A is a schematic view and thus an insufficient basis for drawing conclusions as to the construction of the rotor. On the contrary, the board finds that Figure 1A discloses a one piece rotor, the groove 252 and the gear 254 being formed starting from the cylindrical outer surface of the rotor and being integral parts of the rotor.

6.5 Thus the board has no objection under Article 123 EPC to claim 1 according to the second auxiliary request.

7. *Claim 1 of the second auxiliary request*

7.1 The subject-matter of this claim is novel since it is more restricted than claim 1 of the main and first auxiliary requests whose subject-matter was found novel in section 3 above.

7.2 The additional feature in claim 1 of the second auxiliary request is taken not from an originally filed claim but from Figure 1A and so it is unlikely that the search examiner ever looked for it. Moreover the

feature was introduced for the first time partway through the oral proceedings before the board and so the appellant has had no opportunity to consider it and search for it.

7.3 The board will not itself consider this claim further but, in order to preserve the right of both the appellant and the respondent to argue before two instances, will remit the case to the first instance for further prosecution (Article 111(1) EPC). The finding in the above section 6.5 is however not open for further argument before the opposition division.

7.4 The board will merely remark that:

- contrary to the impression given by Figure 3 of D4, the gears 6 and 7 are not mounted directly on the rotors 1 and 2 because, according to column 2, lines 38 to 41, the gears 6 and 7 are disposed in an internal cavity of the case 5 separated in a fluid tight manner from chambers 3 and 4 by a front partition; and

- D5 is not relevant because its rotor 8 drives rotor 6 directly and not via gears (see Figures 1 and 3).

8. *Reimbursement of the appeal fee*

8.1 The appellant argues that the opposition division contravened Articles 114(2) and 113(1) EPC by deciding that documents D3 and D4 were late filed and therefore not considering them (Article 114(1) EPC).

8.2 Indeed, the opposition division stated on page 3, section 1 of the decision that these documents "are filed late and will be disregarded, pursuant to Article 114(2) EPC".

However there immediately followed the statement that the opposition division considered "that these documents are not relevant for the decision because none of them unambiguously discloses contact preventing gears being provided at the end of the peripheral surface of the rotors."

8.3 Therefore it is clear that the opposition division did not disregard documents D3 and D4 merely because, in its view, they were filed late but also for lack of relevancy.

It is also clear from the second paragraph of section 10 to section 13 of the minutes of the oral proceedings that these documents were discussed by the parties and the opposition division.

8.4 Thus the board finds that Articles 114(2) and 113(1) EPC were not contravened and that the opposition division did not commit a substantial procedural violation (which is one of the conditions laid down in Rule 67 EPC for reimbursement of the appeal fee).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution on the basis of claims 1 to 3 of the second auxiliary request, filed during the oral proceedings of 5 June 2002, description pages 2, 2a, 2b, 3 and 4 and Figures 1A, 1B and 2 to 6 as filed with the letter of 15 May 2002.

3. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

G. Magouliotis C. Andries